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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/477,870	01/05/00	JAN	C 042390.P5488

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EXAMINER

OWENS, D

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

03/28/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/477,870

Applicant(s)

JAN ET AL.

Examiner

Douglas W Owens

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-39 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 31-39 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,4,5.
- 18) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 31-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. The term "thin first/second/third spacers" and "thick fourth spacers" in claims 31 and 35-38 is a relative term which renders the claim indefinite. The terms "thin spacers" and "thick spacers" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

4. Claims 31-39 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the structural relationship between the recessed spacers and other features of the device. The requirement of the spacers being recessed is incomplete without knowing what other features the spacers are recessed with respect to. In other words, it is not know what the spacers are recessed in.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 31-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent No. 5,847,428 to Fulford, Jr. et al., in view of US patent No. 6,191,462 to Chen-Hua.

Regarding claim 31, Fulford, Jr. et al. teaches a gate electrode, comprising:

an insulative layer (Col. 7, lines 57-58);

a gate layer (114) on the insulative layer;

first spacers (128) on opposing sides of the gate;

second spacers (¹³⁶~~148~~) adjacent the first spacers;

third spacers (148) adjacent the second spacers; and

fourth spacers (160) adjacent the third spacers.

Fulford, Jr. et al. does not teach a conductive layer on the gate layer. Chen-Hua teaches a gate structure with a conductive layer on the gate layer. It would have been obvious to one of ordinary skill in the art to incorporate the conductive layer taught by Chen-Hua into the device taught by Fulford, Jr. et al., since it is desirable to provide a gate contact with reduced resistance.

Fulford, Jr. et al. does not explicitly teach recessed spacers. It is conventional in the art to provide insulative layers above the gate as taught by Chen-Hua, to prevent

shorting between devices and to provide layers to build other features of a device on, such as DRAM capacitors. The spacers taught by Fulford, Jr. et al. would have been recessed with respect to an upper surface of layers that are added to the device.

Regarding claim 32, Fulford, Jr. et al. does not explicitly teach an insulative layer that is an oxide. It is well known in the art to use oxides for the gate dielectric. It would have been obvious to one of ordinary skill to incorporate a material that is well known and well suited for the intended use.

Regarding claim 33, Fulford, Jr. et al. teaches a gate electrode that is polysilicon.

Regarding claim 34, Fulford, Jr. et al. does not teach a conductive layer that is a polycide. Chen-Hua teaches a conductive layer that is a polycide. It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Chen-Hua into the device taught by Fulford, Jr. et al. for reasons discussed above.

Regarding claims 35 and 37, Fulford, Jr. et al. teaches a gate electrode, wherein the first and third spacers are an oxide.

Regarding claim s 36 and 38, Fulford, Jr. et al. teaches a gate electrode, wherein the second and fourth spacers are a nitride.

Regarding claim 39, Fulford, Jr. et al. does not teach a conductive layer comprising titanium salicide. Chen-Hua teaches a conductive layer comprising titanium salicide. It would have been obvious to one of ordinary skill to incorporate the teaching of Chen-Hua into the device taught by Fulford, Jr. et al. for reasons discussed above.

Conclusion

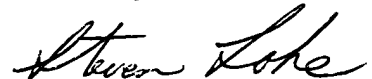
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 703-308-6167. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

DWO
March 22, 2001

Steven Loke
Primary Examiner

A handwritten signature in black ink, appearing to read "Steven Loke", written in a cursive style.